Defining Sensitive Areas and Management Practices to Reduce Groundwater Contamination Workgroup

Workgroup Recommended Practices for Sensitive Areas
Monday, November 23, 2015

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OVERVIEW

During the October 21, 2015 Defining Sensitive Areas and Management Practices to Reduce Groundwater Contamination Workgroup (Workgroup) each workgroup member was assigned a task to develop a maximum of 10 recommended management practices in sensitive areas. The following sections contain those prior workgroup recommendations that reached a consensus as well as recommendations submitted by each workgroup members categorized by a specific topic. Each proposed recommendation has not been altered and is listed with the wording used by that specific workgroup member.

Cropping

5. CAFO NMPs should not rely on getting rid of all or most of manure on corn fields in the fall. CAFOs should diversify crop fields and time of planned applications.

6. Keep a living root in the ground
    a. Cover crop
    b. Permanent cover – forage crops, pasture

Depth to Bedrock/Groundwater

7. Soil depth to bedrock and groundwater:
    a. No manure application on soils <3 feet to bedrock and groundwater and implement c. below
    b. No untreated liquid manure application on soils <4 feet to bedrock and groundwater and implement c. below
    c. When applying manure on soils > 3 feet (or > 4 feet for untreated liquid manure) to bedrock or groundwater and as weather and soil conditions allow:
        i. Complete pre-tillage or immediately incorporate manure (except for established alfalfa or other established crops
        ii. No injection unless pre-tillage completed
        iii. Limit application rate to < 10,000 gal/acre/application

Groundwater Conduits

8. Adopt Karst Task Force #3, Setbacks and Land Draining to Sinkholes, Closed Depressions, or Bedrock Openings in its entirety. (see appendix)

✓ 9. Permanently mark identified GW conduits (sinkholes, other identified bedrock features) and drain tiles within/adjacent to field AND implement the following:
    a. Install a 5 foot vegetated buffer around the feature(s).
    b. The feature(s) and 5 foot buffer should not be tilled, planted, or receive nutrients.

10. No manure application within:
    a. 1,000 feet of public "community" water supply wells

iii. No spreading of liquid manure within 24 hours before, during or after rainfall with potential for runoff (using DATCP Advisory system)

b. In Highly Sensitive areas (all of sensitive areas recommendations above and):
   i. No liquid manure in areas of less than 5' depth to bedrock.
   ii. Liquid manure limited to 6,000 gal/acre/year (also recommended by Bill Schuster in 590 comments)
   iii. Commercial fertilizers applied at same rate as alfalfa
   iv. No lands within highly sensitive area approved for emergency spreading or headland stacking

18. Accept recommendation that all applications of liquid manure in sensitive areas be immediately incorporated at a depth of 8 inches or less on harvested fields.

19. Adopt Karst Task Force #4, Requirements for Persons or Conduct Applications of Animal Wastes in Shallow Carbonate Bedrock (<50') Areas its entirety. (see appendix)

20. No application of any waste in closed depressions after fall harvest of crops.

21. Inspect fields according to a. and b. below for GW conduits, contributing channels or areas that drain to GW conduits, drain tiles that may drain/discharge to groundwater conduits and evidence of fracture traces; keep inspection logs and update NMP maps with identified features.
   a. Inspect annual cropped fields in spring before manure application/tillage/planting or in late summer/fall after crop harvest and before manure application/tillage/planting.
   b. Inspect alfalfa/perennial cropped fields in spring and summer before or 7-10 days after cutting – look for uneven crop growth that follows distinct lines.

22. No surface application* on slopes greater than 6% unless spread material immediately incorporated or injected; no surface application on slopes greater than 12%
*=does not apply to perennial forage crop(s)

23. Liquid manure should be applied during the growing season or within 10 days of crop establishment and as split applications (not to exceed 10,000 gallons per acre per event) throughout the season. Liquid manure applications during the fall should be avoided as much as possible.

i. Allow solid applications based on agronomic rates.
ii. Incorp within 72 hours

b. 590 liquid manure
   i. Allow liquid applications based on agronomic rates or manure analysis using 2 of the following 5 items:
      - Use N stabilizer.
      - Use pre tillage.
      - Cover crops to manage nitrogen if conditions allow.
      - Reduce rate if soil OM is below 2.0% OM.
      - If less than 2% OM use a split application to apply nutrients.

c. 243 solid manure
   i. Allow solid applications based on agronomic rates.
   ii. Incorp within 72 hours

d. 243 liquid manure
   i. Allow liquid applications based on agronomic rates or manure analysis using 2 of the following 5 items:
      - Use N stabilizer.
      - Use pre tillage.
      - Cover crops to manage nitrogen if conditions allow.
      - Reduce rate if soil OM is below 2.0% OM.
      - If less than 2% OM use a split application to apply nutrients.

28. 60" and greater:
   a. 590 solid manure
      i. Allow solid applications based on agronomic rates.
      ii. Surface or incorp
   b. 590 liquid manure
      i. Allow liquid applications based on agronomic rates or manure analysis
   c. 243 solid manure
      i. Allow solid applications based on agronomic rates
      ii. Surface or incorp
   d. 243 liquid manure
      i. Allow liquid applications based on agronomic rates or manure analysis

Manure Storage & Management

29. CAFOs should develop more than 180 days of storage given the difficulty acknowledged with calculating volume needed for 180 days, including fluctuating animal populations,

38. All livestock operations that land apply manure prepare and implement a NM plan that reflects, at a minimum, the proposed NRCS 590 standard.

39. Develop and implement a plan for emergency* liquid waste applications (as defined in NR 243) on frozen and snow covered soils that are > 20 feet to bedrock depth using proposed NRCS 590 winter spreading criteria and the following requirements:
    a. Notify Land Conservation Department and DNR (CAFO farms only) prior to application
    b. 200 foot setbacks from identified channels that lead/discharge to GW conduits or GW recharge areas
    c. Evaluate and rank fields for low, medium and high risk emergency applications based upon criteria i-iv. below; low risk fields are first priority for application.
        i. % of restricted area within field from setback, slope and bedrock depth restrictions
        ii. Number of identified karst features within or immediately adjacent to field
        iii. % field area with identified fracture traces
        iv. Number of channel(s) in field that lead to identified groundwater conduits or recharge areas within or adjacent to field

*=recommendation presumes 180 days available storage capacity

Funding

40. EPA should provide additional funding for the Borchardt study so that it can produce more robust data on the source of the groundwater pollution.

41. Work with NRCS to reprioritize EQUIP monies to elevate practices that protect groundwater and surface waters.

Sensitive Areas

42. Recommendations for "Areas Susceptible to Groundwater Contamination" document:
    a. Adopt the Karst Report recommendations for defining sensitive areas based on depth to bedrock:
        i. Under 20 feet – highly sensitive
        ii. Between 21-50 feet – sensitive
    b. Categorize the following as "highly sensitive":

Tile

50. Require lateral termination of all subsurface field drain tiles within 100 feet of waters of the state, conduits to groundwater , and concentrated flow channels (NOTE: NRCS recommendation).

51. Operators should locate all tile lines in advance of obtaining permission to spread on a proposed field. Aerial technology should help.

52. Require lateral termination of subsurface field drain tile at a minimum of 100' to Waters of the State, conduits to groundwater, concentrated channels and the like (NRCS recommendation)

OTHER TOPICS

In addition to 10 recommended management practices each member could also submit additional topics that may be discussed at future meetings. These additional topics and further discussion may lead to additional recommended management practices. The other topics for discussion submitted include the following:

53. Depressional groundwater recharge areas need a clear definition; specifically the workgroup needs to define the term 'shallow'.

54. Discuss feasibility of CAFOs installing some of the treatment methods used at wastewater treatment plants identified in Heidi's presentation. Primarily treatment to remove solids and spread separately from liquid waste? Secondary treatment?

55. Further discuss tradeoffs with recommended practices such as limiting applications on shallow soils, crop rotation, cover crops, etc.

56. Discuss petitioner comments on areas susceptible to groundwater contamination document. (see attached June 8, 2015, petitioner letter to DNR)
    a. Will this be formal guidance?
    b. Are there certain areas to designate as susceptible to groundwater contamination such as those with less than 20 feet depth to bedrock? Including a bright-line where feasible adds clarity and consistency.
    c. Are current standards sufficient for sandy, well-drained soils?

Appendix

Page 9, Final Report of the Northeast Wisconsin Karst Task Report (2007-02-09)

3. Setbacks and Land Draining to Sinkholes, Closed Depressions or Bedrock Openings (includes losing streams on carbonate bedrock)

a. There is a high probability of groundwater contamination when manure is applied to land areas within closed depressions and within drainage areas that contribute runoff to sinkholes or bedrock openings (Criteria 1).

b. Land areas near channels and concentrated flow paths that deliver runoff to closed depressions, sinkholes and bedrock openings are the most critical to the quality of runoff water.

c. No runoff or concentrated flow of liquid wastes.

RECOMMENDATIONS:

#	Hazard/Sensitive Feature	Limitation	Exceptions/comments
1	Sinkholes, bedrock openings, surface inlets, and areas of focused infiltration within closed depressions	No applications of wastes within 100 feet.	None
2	Delivery system * to sinkholes, bedrock openings, surface inlets, and areas of focused infiltration within closed depressions.	No application of wastes within 100 feet.	None
3	Closed depressions, regardless of soil depth.	Incorporation of all wastes immediately after application.	None

* Delivery system is a defined channel or concentrated flow path.

4. Requirements for Persons Who Plan or Conduct Applications of Animal Wastes in Shallow Carbonate Bedrock (<50 ft) Areas

RECOMMENDATIONS:

Hazard/Sensitive Feature	Limitation	Exceptions/ comments
Areas with less than 50 feet of soil to carbonate bedrock (Categories 1, 2 and 3)	Require field investigations to identify and map closed depressions, sinkholes, bedrock openings, bedrock outcrops, surface inlets, and areas of focused infiltration within closed depressions and drainage areas to these features (Figure 5) during nutrient management planning	None
	Require a spill response plan for waste storage, transport, and applications.	None
	Require training on karst topography, spill response planning, and field identification of the above sensitive features.	None